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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/072,813	02/08/2002	David P. Wilkinson	130109.447C1	3578

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EXAMINER

CREPEAU, JONATHAN

ART UNIT PAPER NUMBER

1746

DATE MAILED: 12/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/072,813

Applicant(s)

WILKINSON ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-10 and 20-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8-10, 20, 21 and 28 is/are allowed.
- 6) ☒ Claim(s) 22-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 8-10 and 20-28. Claims 8-10, 20, 21, and 28 are allowed. Claims 22-27 remain rejected for the reasons of record. Accordingly, this action is made final.

Claim Rejections - 35 USC § 103

2. Claims 22, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over under WO 97/08766 in view of Hamada et al.

In claim 1, WO '766 discloses a fuel cell assembly comprising first and second separator plates, a membrane electrode assembly, cathodes and anodes comprising substrates with electrocatalysts disposed thereon, a reactant flow path extending across the electrochemically active area of at least one electrode for directing a fluid stream between inlet and outlet ports, and an in-plane nonuniform structure on the electrode for imparting uneven fluid transport properties as the active area is traversed in the direction of the flow path (also see Figs. 5-8, 14A, and 14B). As shown in Figures 5-7, the structure of the electrode may vary symmetrically as the active area is traversed. As shown in Figure 7, the material composition of the substrate may also vary symmetrically. The substrate is a cathode substrate (see page 17, line 27).

WO '766 does not expressly teach that the oxidant flow path extends "substantially linearly" across the surface of the cathode.

In Figure 3 and in column 4, lines 35-46, Hamada et al. teach a PEM fuel cell with substantially linear cathode and anode flow channels.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because as exemplified by the disclosure of Hamada et al., linear flow channels are well-known in the art. Since these flow channels offer advantages such as a low pressure drop and relative ease of construction, the artisan would therefore possess sufficient skill to use them in the fuel cell of WO '766. Accordingly, this limitation is not considered to distinguish over the references.

3. Claim 25, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO '766 as applied to claims 22, 23, and 24 above, and further in view of Frost et al (U.S. Patent 5,702,839).

WO '766 does not expressly teach that the substrate comprises a coating having a varying loading (claim 25) or varying composition (claim 26) is located on the surface of the substrate.

Frost et al. teaches an electrode having a non-uniform structure (see abstract). In column 6, line 62 et seq., the reference teaches that the electrode substrate comprises a coating which has a varying composition (e.g., a polymeric composition). Furthermore, the coating may have a varying loading (see col. 7, line 27).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to apply the

nonuniform coating layer of Frost et al. on the electrode substrate of WO '766. In column 6, line 66 Frost et al. teach that "the component whose amount varies in the non-uniform layers [is] chosen to promote enhanced electrochemical performance." As such, the artisan would be motivated to apply the nonuniform coating layer of Frost et al. on the electrode substrate of WO '766.

Double Patenting

4. Claims 22-24 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 20-41 of copending Application No. 10/079,612. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of the '813 application anticipate the instant claims. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Response to Arguments

5. Applicant's arguments filed September 21, 2004 have been fully considered but they are not persuasive insofar as they apply to the present rejections. Applicants urge that the WO '766 reference does not teach that the structure of the electrode varies substantially symmetrically as the electrode is traversed in plane. Applicants state that "Figures 5-8 of PCT '766, as relied upon

by the Examiner, disclose structural nonuniformity (i.e., grooves, openings, etc.) that are introduced at regular intervals across the entire electrochemically active area – that is, there is no uneven distribution or irregular spacing of structural in-plane nonuniformity.” However, it is submitted that it is this structure (shown in Figures 6 and 7, in particular) that meets the “substantially symmetrically” claim language. In Figures 6 and 7, if a vertical line is drawn halfway through the figure, each resulting half would have exactly the same structure. Thus, it is submitted that these figures show structures having properties that vary “substantially symmetrically” with respect to the halfway point of the flow path. Applicant’s reference to Figures 3A-3C of the instant application is noted, but the claim language does not reflect the type of symmetry shown in these Figures. These Figures show gradients, or gradual or step-wise increases or decreases—features that are not recited in the claims. It is noted, however, that an amendment to introduce this language after final rejection may be considered to raise a new issue and thus may be denied entry.

Regarding the rejection of claims 25, 26, and 27 over the Frost reference, Applicants state that the reference discloses a biased, rather than symmetrical, configuration. While this argument has merit, it is submitted that the language employed in claims 24, 25, 26, and 27 does not exclude the use of such biased coating layers. Independent claim 24 recites that “the material composition of said first electrode substrate varies substantially symmetrically.” Dependent claims 25, 26, and 27 recite that the loading, composition, and equivalent weight of a coating on the substrate “var[y] as the electrochemically active area of said first substrate is traversed.” The dependent claims do not specify that the loading, composition, and equivalent weight must vary “substantially symmetrically.” It is believed that the claims may be interpreted such that claim

24 requires symmetry in the substrate *per se*, while the dependent claims require a coating having properties which do not have to vary symmetrically (they simply have to vary). As such, it is believed that the rejection over the Frost reference is proper.

Allowable Subject Matter

6. Claims 8-10, 20, 21, and 28 are allowed.
7. The following is a statement of reasons for the indication of allowable subject matter:
Claims 9, 10, 20, 21, and 28 are allowable for the reasons previously set forth.
Regarding claim 8, Applicant's arguments regarding the GB 2316802 reference are persuasive and claim 8 is now allowable.

Conclusion

8. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

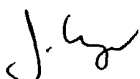
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jonathan Crepeau
Primary Examiner
Art Unit 1746
November 30, 2004